CATERPILLAR

# Service Manual

## 309 MINI HYD EXCAVATOR

**Note: Use Bookmarks panel to navigate**

**Printed by Heavy Equipment Manuals** **Printed in U.S.A**
**v2.20**

Heavy Equipment Manuals

M0095130-08 307.5, 308, 308.5, 309, and 310 Mini Hydraulic Excavator Machine Systems 2
M0095133-03 307.5, 308, 308.5, 309, and 310 Mini Hydraulic Excavator Engine Supplement 436
UENR3262-00 Seal Installation 511
UENR3278-09 C3.3B Engines for Caterpillar Built Machines 574
UENR4125-10 Air Conditioning and Heating R134a for All Cat Machines 735

Product: MINI HYD EXCAVATOR
Model: 309 MINI HYD EXCAVATOR GG9
Configuration: 309 CR Mini Hydraulic Excavator GG900001-UP (MACHINE) POWERED BY C3.3B Engine

**Disassembly and Assembly**
**307.5, 308, 308.5, 309, and 310 Mini Hydraulic Excavator Machine Systems**
**Media Number -M0095130-08** **Publication Date -01/10/2020** **Date Updated -06/10/2020**

i07561403

# Accumulator - Remove and Install

**SMCS** - 4263-010; 4331-010; 5077-010; 7336-010

**S/N** - GG81-UP

**S/N** - GG91-UP

**S/N** - GK81-UP

**S/N** - GW71-UP

**S/N** - GW81-UP

**S/N** - GW91-UP

**S/N** - GWT1-UP

**S/N** - GX81-UP

# Removal Procedure

Table 1

| Required Tools | | | |
|---|---|---|---|
| **Tool** | **Part Number** | **Part Description** | **Qty** |
| A | 311-1362 | Vacuum Gauge Gp | 1 |

1. Release the hydraulic system pressure. Refer to Operation and Maintenance Manual, "System Pressure - Release."

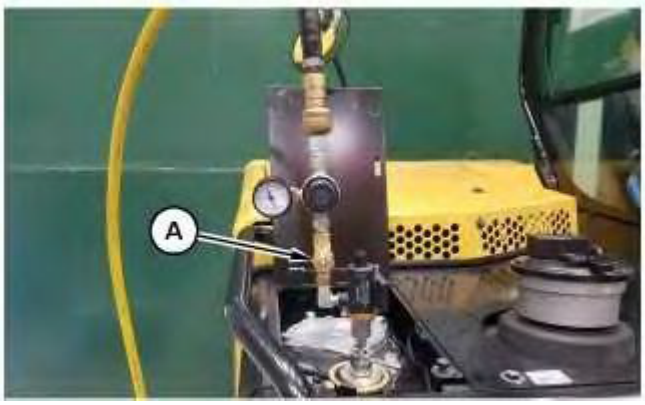



Illustration 1 g06452271

2. Install Tooling (A) onto the hydraulic tank. Attach an air supply hose onto Tooling (A). Apply 138 kPa (20 psi) to pull a vacuum on the hydraulic system.

Illustration 2 g06452259

3. Open door (1).

Illustration 3 g06359621

4. Remove accumulator (2).

# Installation Procedure

1. Install accumulator (2) in the reverse order or removal.

Copyright 1993 - 2023 Caterpillar Inc.
All Rights Reserved.
Private Network For SIS Licensees.

Product: MINI HYD EXCAVATOR
Model: 309 MINI HYD EXCAVATOR GG9
Configuration: 309 CR Mini Hydraulic Excavator GG900001-UP (MACHINE) POWERED BY C3.3B Engine

**Disassembly and Assembly**
**307.5, 308, 308.5, 309, and 310 Mini Hydraulic Excavator Machine Systems**
**Media Number -M0095130-08** **Publication Date -01/10/2020** **Date Updated -06/10/2020**

i07848380

# Actuator Motor (Water Valve) - Remove and Install

**SMCS** - 7304-010-MQ

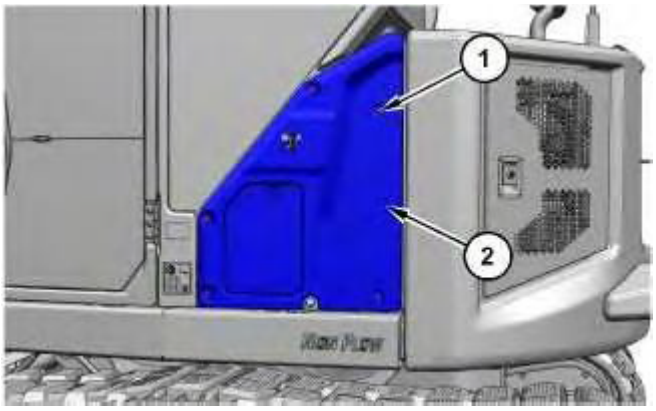
## Removal Procedure

**NOTICE**

**Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting, and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.**

**Refer to Special Publication, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.**

**Dispose of all fluids according to local regulations and mandates.**



This is the sample of the manual click on the download link for complete manual

DOWNLOAD LINK

For some reason if link does not work download this pdf and then click

Illustration 1 g06455132

1. Remove bolts (1) and cover assembly (2).

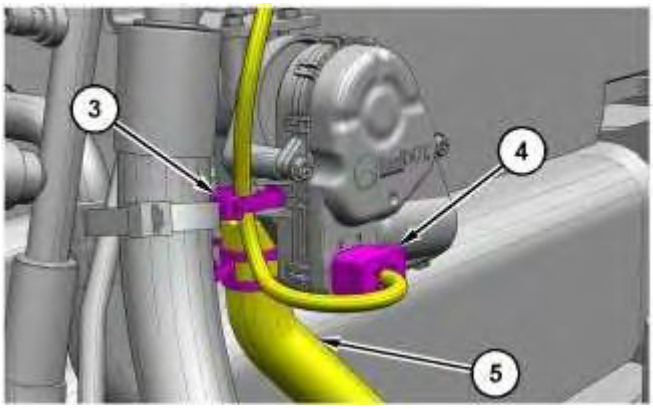



Illustration 2 g06455133

2. Remove cable strap (3) and disconnect harness assembly (4).
3. Disconnect hose (5).

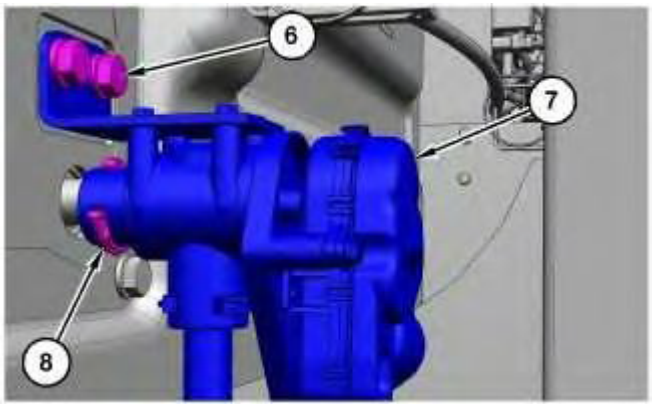



Illustration 3 g06455134

4. Remove clip (8).
5. Remove bolts (6) and actuator valve (7).

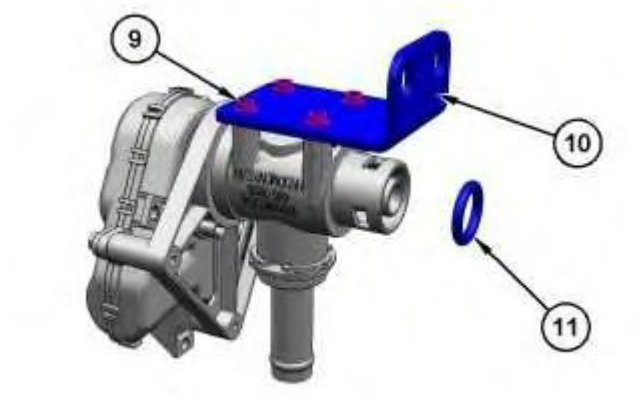



Illustration 4 g06455135

6. Remove O-ring seal (11).
7. Remove screws (9) and mounting plate (10).

## Installation Procedure

Table 1

| Required Tools | | | |
|---|---|---|---|
| **Tool** | **Part Number** | **Part Description** | **Qty** |
| A | 465-7614 | Clip | 1 |
| B | - | Silicone Dielectric lubricant | - |

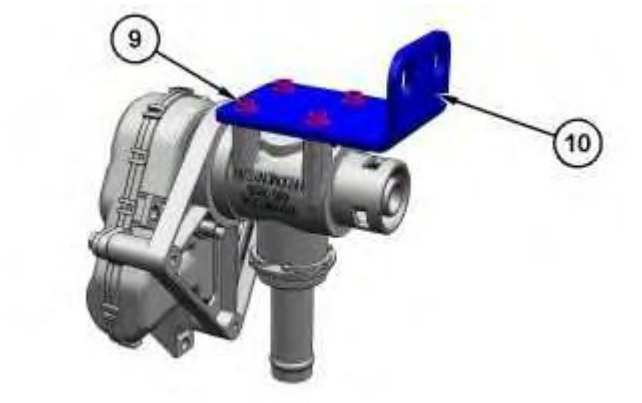



Illustration 5 g06455179

1. Install mounting plate (10) and screws (9).

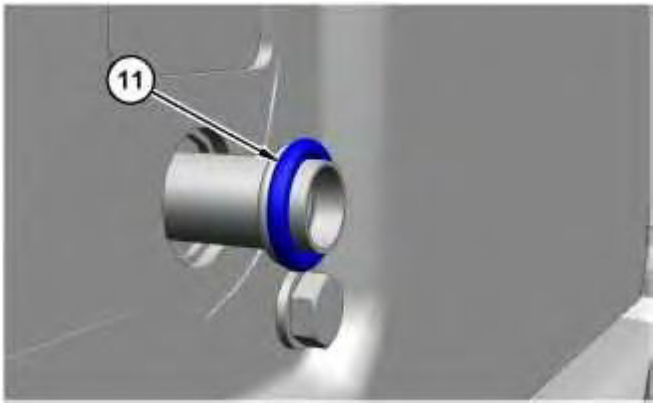



Illustration 6 g06455180

2. Apply Tooling (B) to O-ring seal (11). Install O-ring seal (11) onto the conditioner tube.

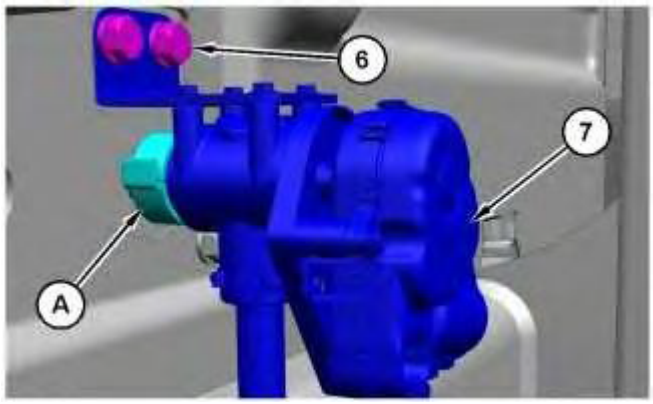



Illustration 7 g06455181

3. Install Tooling (A) onto actuator valve (7). Install actuator valve (7).
4. Install bolts (6). Tighten bolts (6) to a torque of 15 ± 3 N.m (133 ± 27 lb in).

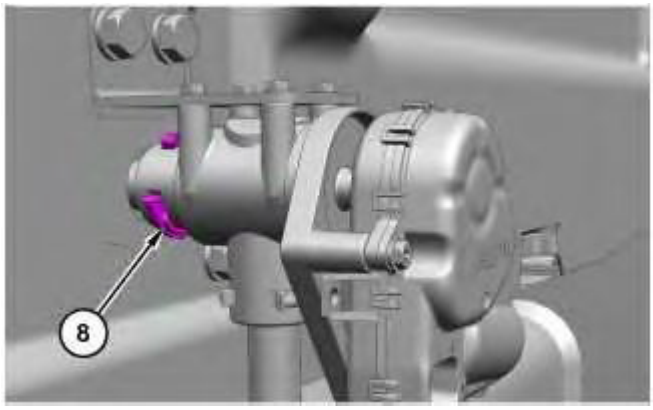



Illustration 8 g06455183

5. Remove Tooling (A) and install clip (8).

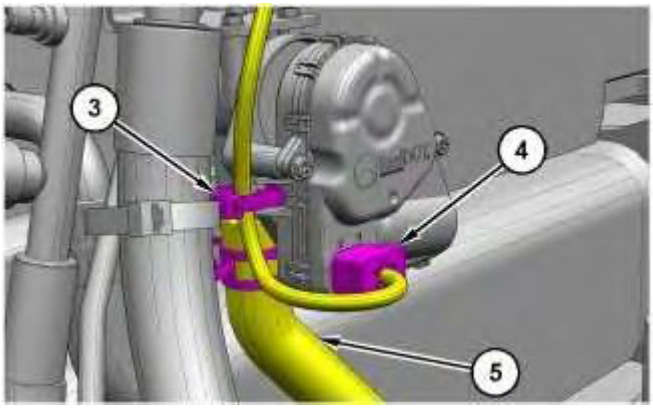



Illustration 9 g06455133

6. Connect hose (5).
7. Connect harness assembly (4) and install cable strap (3).

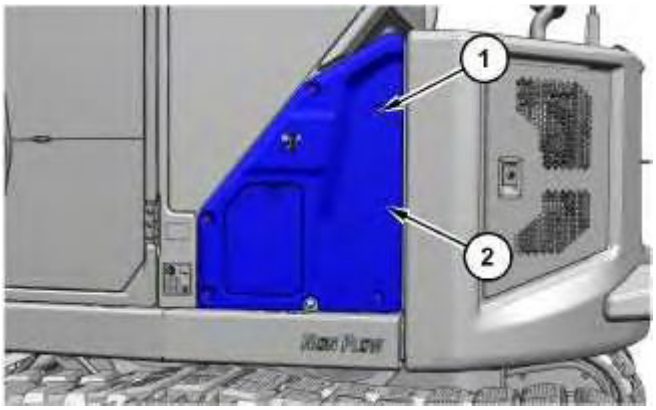



Illustration 10 g06455132

8. Install cover assembly (2) and bolts (1).

Copyright 1993 - 2023 Caterpillar Inc.
All Rights Reserved.
Private Network For SIS Licensees.
Thu Oct 26 11:46:37 UTC+0530 2023

Product: MINI HYD EXCAVATOR
Model: 309 MINI HYD EXCAVATOR GG9
Configuration: 309 CR Mini Hydraulic Excavator GG900001-UP (MACHINE) POWERED BY C3.3B Engine

**Disassembly and Assembly**
**307.5, 308, 308.5, 309, and 310 Mini Hydraulic Excavator Machine Systems**
**Media Number -M0095130-08** **Publication Date -01/10/2020** **Date Updated -06/10/2020**

i07550771

# Blower Motor (Air Conditioner, Heater) - Remove and Install

**SMCS** - 7304-010-BW; 7309-010-BW; 7320-010-BW

**S/N** - GG81-UP

**S/N** - GG91-UP

**S/N** - GK81-UP

**S/N** - GW71-UP

**S/N** - GW81-UP

**S/N** - GW91-UP

**S/N** - GWT1-UP

**S/N** - GX81-UP

# Removal Procedure

**Start By:**

a. Remove the hydraulic lockout control

b. Remove the joystick control assembly

c. Remove the seat

1. Turn the battery disconnect switch to the OFF switch.

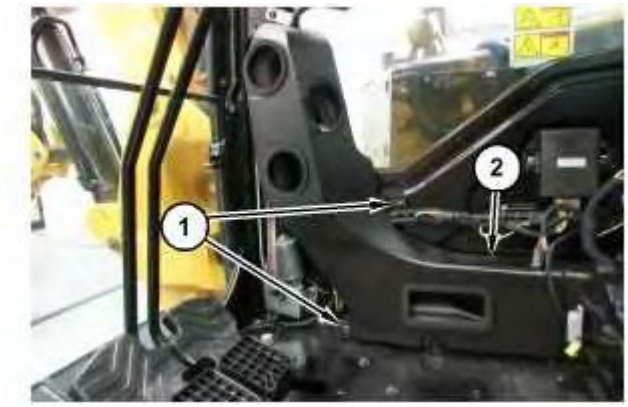



Illustration 1 g06357269

2. Remove screws (1) and duct assembly (2).

Illustration 2 g06357274

3. Remove screws (3) and duct assembly (4).

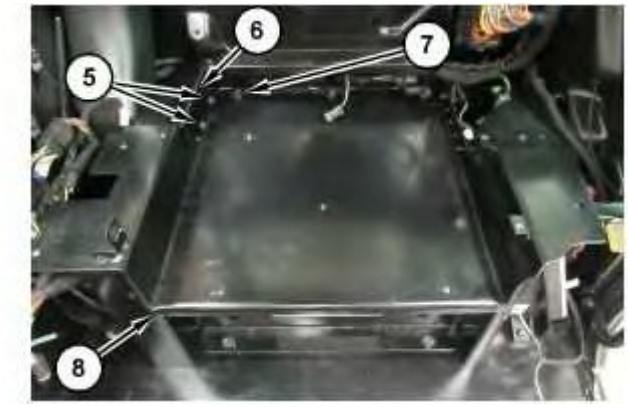



Illustration 3 g06357287

4. Remove bolts (5) and panel (6).
5. Remove five bolts (7) and panel (8).

Illustration 4 g06357290

6. Remove screw (9) and duct (10).

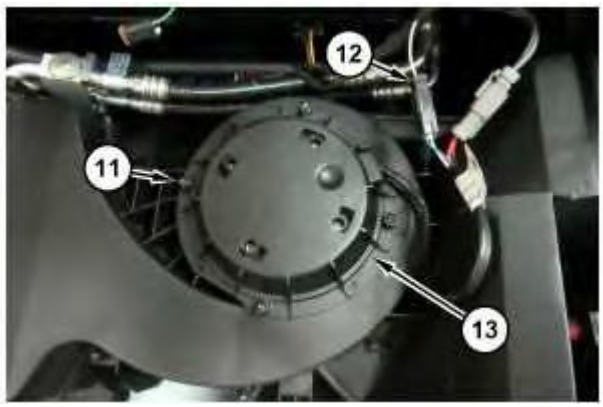



Illustration 5 g06456128

7. Remove four screws (11).
8. Disconnect harness assemblies (12).
9. Remove blower motor (13).

# Installation Procedure

1. Install blower motor (13) in the reverse order of removal.

Copyright 1993 - 2023 Caterpillar Inc.
All Rights Reserved.
Private Network For SIS Licensees.

Product: MINI HYD EXCAVATOR
Model: 309 MINI HYD EXCAVATOR GG9
Configuration: 309 CR Mini Hydraulic Excavator GG900001-UP (MACHINE) POWERED BY C3.3B Engine

**Disassembly and Assembly**
**307.5, 308, 308.5, 309, and 310 Mini Hydraulic Excavator Machine Systems**
**Media Number -M0095130-08** **Publication Date -01/10/2020** **Date Updated -06/10/2020**

i07815246

# Boom - Remove and Install

**SMCS** - 6501-010

# Removal Procedure

Table 1

| Required Tooling | | | |
|---|---|---|---|
| **Item** | **Part Number** | **Part Description** | **Qty** |
| A | 422-2352 | Jack Stand Gp | 1 |
| B | 452-6006 | Grease | 1 |

**WARNING**

**Personal injury can result from hydraulic oil pressure and hot oil.**

**Hydraulic oil pressure can remain in the hydraulic system after the machine has been stopped. Serious injury can be caused if this pressure is not released before any service is done on the hydraulic system.**

**Make sure all the attachments have been lowered, and the oil is cool, before removing any components or lines. Remove the oil filler cap only when the filler cap is cool enough to touch with your bare hand.**

---

**Start By:**

a. Remove the stick cylinder.

b. Remove the stick.

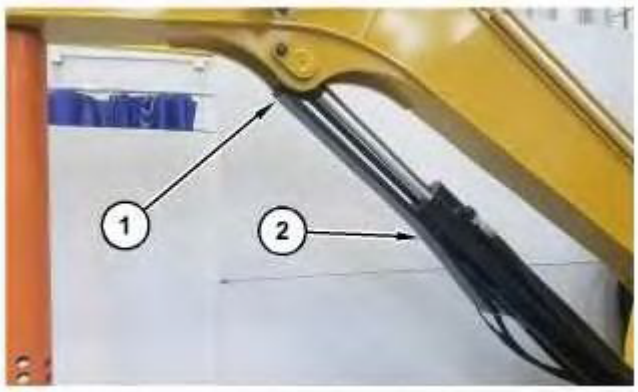



Illustration 1 g06415474

1. Remove bolt (1) and guard (2).

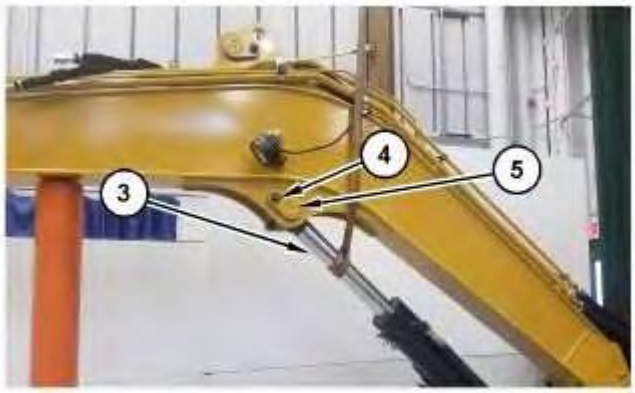



Illustration 2 g06415502

2. Attach a suitable lifting device to the rod end of boom cylinder (3).
3. Remove bolt (4) and pin assembly (5).

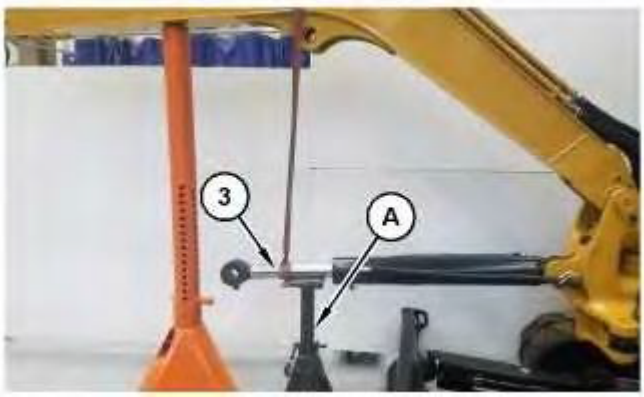



Illustration 3 g06415563

4. Lower the rod end of the boom cylinder (3) onto Tooling (A).

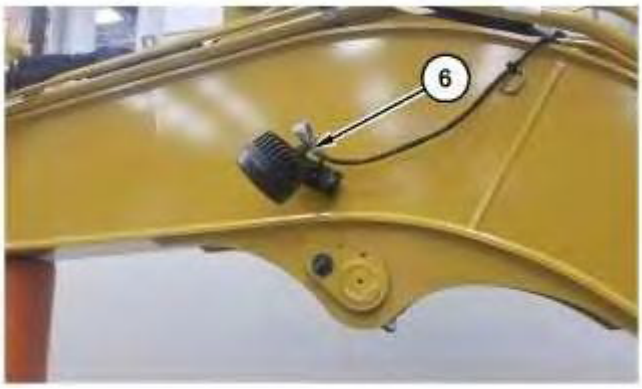



Illustration 4 g06415582

5. Disconnect harness assembly (6). Repeat for the opposite side of the boom.

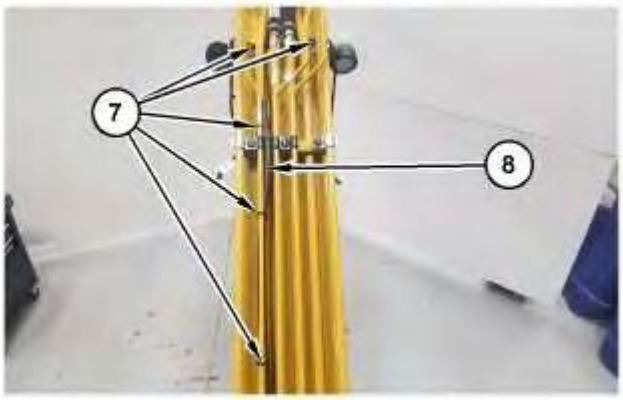



Illustration 5 g06415646

6. Cut cable straps (7).
7. Position harness assembly (8) out of the way.

Illustration 6 g06415666

**Note:** Note the orientation of hose assemblies (9) for installation purposes.

8. Disconnect hose assemblies (9).

Illustration 7 g06415741

**Note:** Note the orientation of hose assemblies (10) for installation purposes.

9. Disconnect hose assemblies (10).

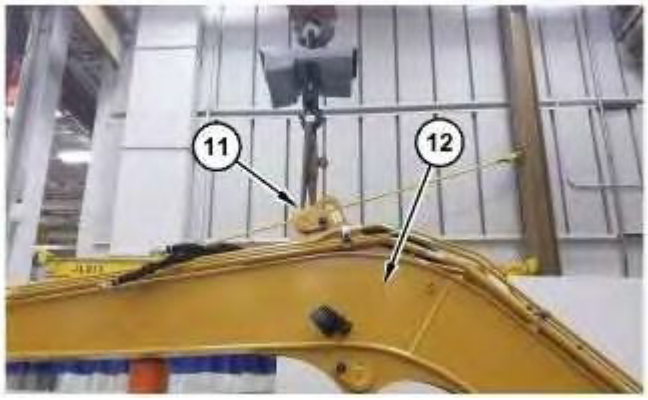



Illustration 8 g06415880

10. Attach a suitable lifting device to pin assembly (11) on top of boom (12).

    The weight of the boom is approximately 458 kg (1010 lb).

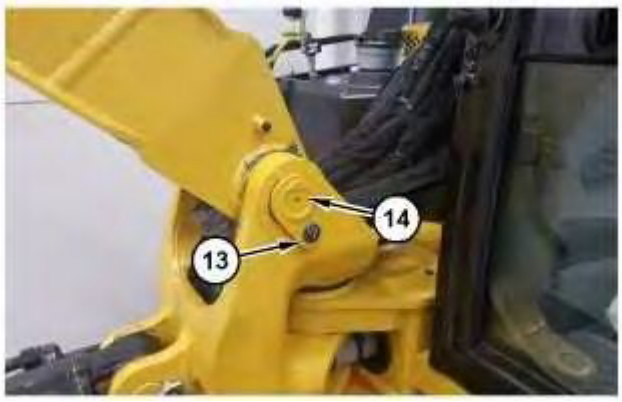


Illustration 9 g06415882

**Note:** Note the number of shims for installation purposes.

11. Remove bolt (13), pin assembly (14), and the shims.

Illustration 10 g06415883

12. Remove boom (12).

# Installation Procedure

1. Install boom (12) in the reverse order of removal.
    a. Install the shims as required to adjust lateral clearance to 0.6 mm (0.024 inch).
    b. Coat all bores and sealing lips with Tooling (B) prior to assembly. After assembly lubricate all joints from the joint fittings.

Copyright 1993 - 2023 Caterpillar Inc.
All Rights Reserved.
Private Network For SIS Licensees.
Thu Oct 26 11:36:24 UTC+0530 2023

Product: MINI HYD EXCAVATOR
Model: 309 MINI HYD EXCAVATOR GG9
Configuration: 309 CR Mini Hydraulic Excavator GG900001-UP (MACHINE) POWERED BY C3.3B Engine

**Disassembly and Assembly**
**307.5, 308, 308.5, 309, and 310 Mini Hydraulic Excavator Machine Systems**
**Media Number -M0095130-08** **Publication Date -01/10/2020** **Date Updated -06/10/2020**

i08268682

# Boom Cylinder - Assemble

**SMCS** - 5456-016

# Assemble

Table 1

| Required Tools | | | |
|---|---|---|---|
| **Tool** | **Part Number** | **Part Description** | **Qty** |
| A | 152-4251 | Repair Bench | 1 |
| B | 4C-8092 | Hydraulic Torque Wrench Gp | 1 |
| C | 162-7189 | Adapter Plate | 1 |
| D | 9U-7868 | Spanner Wrench | 1 |

Illustration 1 g06518591

1. Install O-ring seal (20).

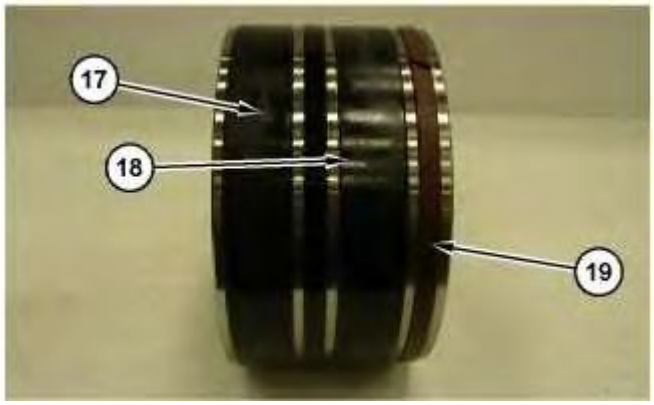



Illustration 2 g06518590

2. Install wear ring (17), (18), and (19).

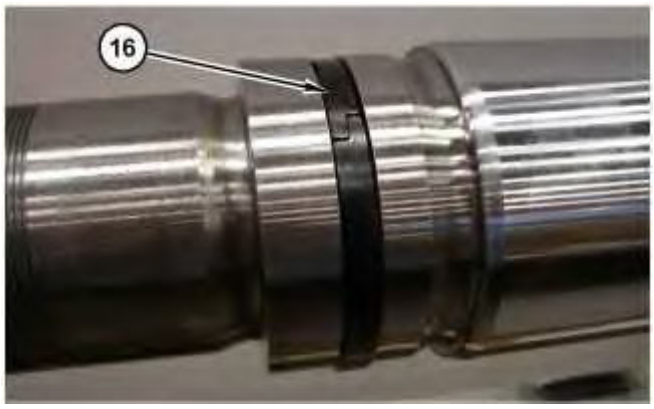



Illustration 3 g06518588

3. Install seal (16).

Illustration 4 g06518583

4. Install snubber (15).

Illustration 5 g06518580

5. Install piston (14).

Illustration 6 g06517039

6. Install nut (13)

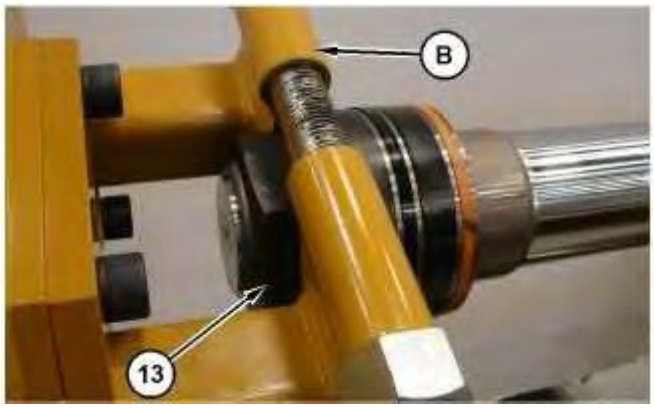



Illustration 7 g06518241

7. Use Tooling (B) to tighten nut (13). Refer to Table 2 for the correct torque specification.

Table 2

| Piston Nut Size | Piston Nut Torque Specification |
|---|---|

| | |
|---|---|
| M45 | 2058 ± 80 N·m (1518 ± 60 lb ft) |
| M50 | 2865 ± 142 N·m (2113 ± 105 lb ft) |
| M52 | 3000 ± 165 N·m (2213 ± 122 lb ft) |
| M56 | 4000 N·m (2950 lb ft) |

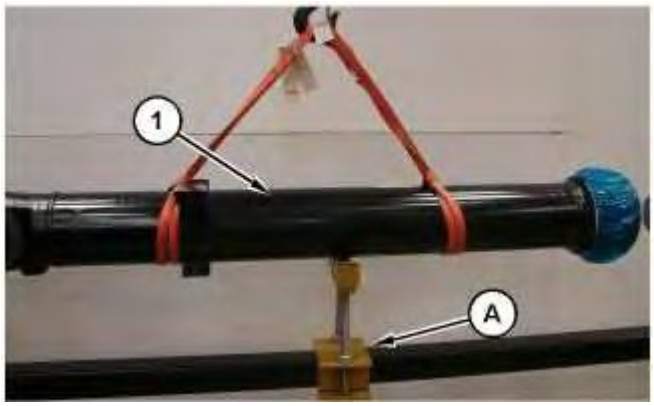



Illustration 8 g06517032

8. Use a suitable lifting device to install boom cylinder (1) on to Tooling (A).

Illustration 9 g06516936

9. Install seals (12).

Illustration 10 g06516920

10. Install seal (11).

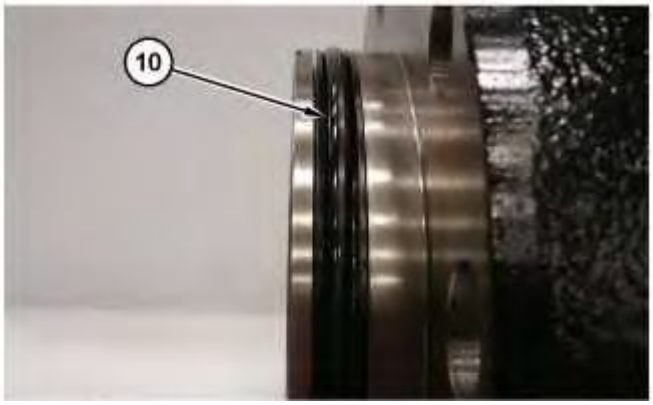



Illustration 11 g06516916

11. Install O-ring seal (10).

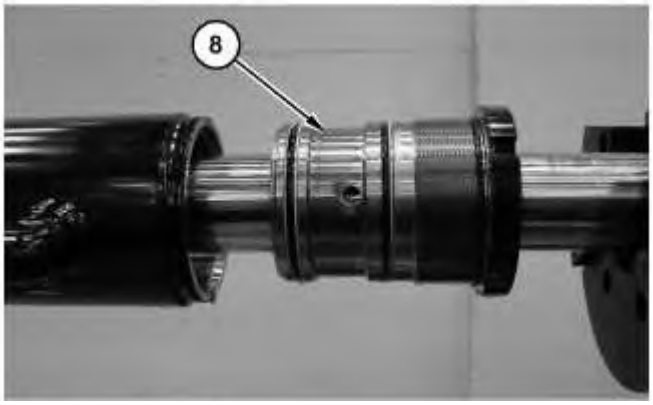



Illustration 12 g06608389

12. Install cylinder head (8) onto cylinder rod (9).

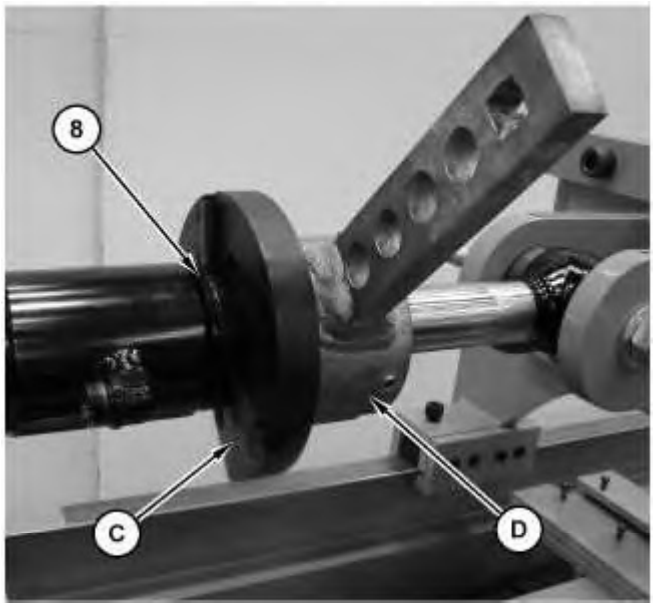



Illustration 13 g06608394

13. Use Tooling (C) and Tooling (D) to tighten cylinder head (8). Refer to Table 3 for the correct torque specification for cylinder head (8).

Table 3

| Cylinder Head Size | Cylinder Head Torque Specification |
|---|---|
| M100 | 550 ± 50 N·m (406 ± 37 lb ft) |
| M105 | 650 ± 65 N·m (480 ± 48 lb ft) |
| M115 | 850 ± 90 N·m (627 ± 66 lb ft) |
| M120 | 900 ± 90 N·m (664 ± 66 lb ft) |
| M125 | 1020 ± 100 N·m (752 ± 74 lb ft) |

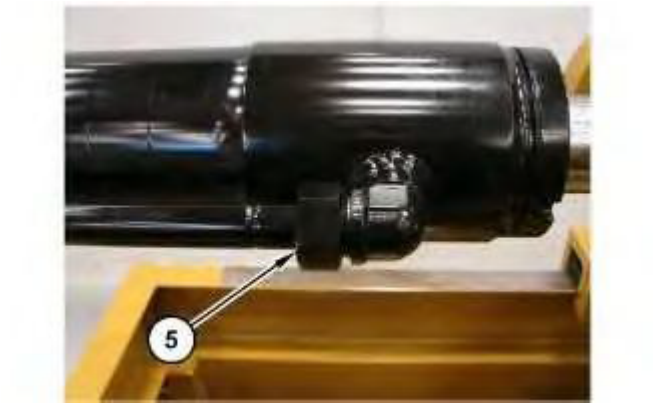



Illustration 14 g06608405

14. Install tube assembly (5). Tighten tube assembly (5) to a torque of 110 ± 10 N·m (8 ± 7 lb ft).

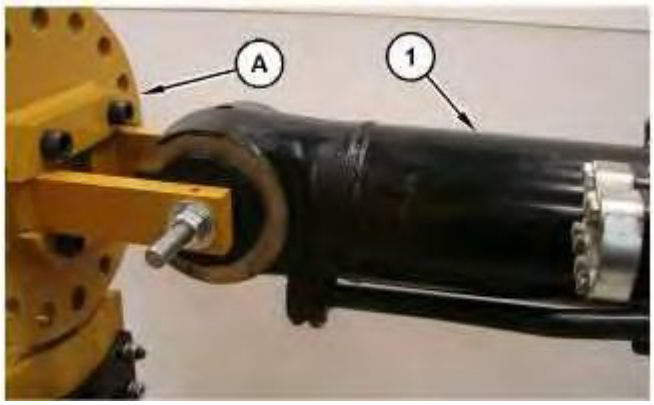



Illustration 15 g06516435

15. Attach a suitable lifting device to boom cylinder (1) and remove from Tooling (A). Boom cylinder (1) weighs approximately 88 kg (195 lb).

## Install the boom cylinder

Copyright 1993 - 2023 Caterpillar Inc.
All Rights Reserved.
Private Network For SIS Licensees.
Thu Oct 26 11:36:06 UTC+0530 2023

Product: MINI HYD EXCAVATOR
Model: 309 MINI HYD EXCAVATOR GG9
Configuration: 309 CR Mini Hydraulic Excavator GG900001-UP (MACHINE) POWERED BY C3.3B Engine

**Disassembly and Assembly**
**307.5, 308, 308.5, 309, and 310 Mini Hydraulic Excavator Machine Systems**
**Media Number -M0095130-08** **Publication Date -01/10/2020** **Date Updated -06/10/2020**

i08033517

# Boom Cylinder - Disassemble

**SMCS** - 5456-015

# Disassemble

**Start By:**

a. Remove the Boom Cylinder

Table 1

| Required Tools | | | |
|---|---|---|---|
| **Tool** | **Part Number** | **Part Description** | **Qty** |
| A | 152-4251 | Repair Bench | 1 |
| B | 4c-8092 | Hydraulic Torque Wrench Gp | 1 |
| C | | link bracket | 1 |

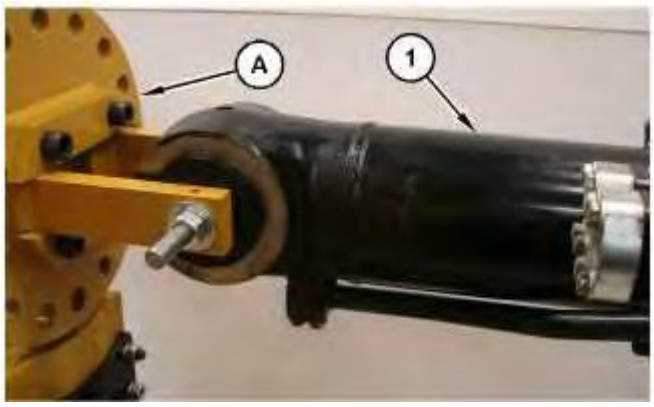



Illustration 1 g06516435

This is the sample of the manual click on the download link for complete manual

DOWNLOAD LINK

For some reason if link does not work download this pdf and then click